

METHOD OF FORMING POROUS FILM,

WIRING STRUCTURE, AND METHOD OF FORMING THE SAME

*This application is a DIV of 10/126,687 04/22/2002 PAT 6,602,802
which is a DIV of 09/462,349 01/27/2000 PAT 6,387,824.*

BACKGROUND OF THE INVENTION

5 The present invention relates to a method of forming a porous film used as, e.g., an inter-layer dielectric in a semiconductor integrated circuit device.

As the integration density of a semiconductor integrated circuit has increased, an increased wiring delay time resulting
10 from an increase in wire-to-wire capacitance, which is a parasitic capacitance between metal wires, has presented an obstacle to the implementation of a semiconductor integrated circuit with higher performance. The wiring delay time is a so-called RC delay which is proportional to the product of the resistance of the metal wire
15 and the wire-to-wire capacitance.

To reduce the wiring delay time, therefore, it is necessary to reduce the resistance of the metal wire or the wire-to-wire capacitance.

As a method of reducing the wire-to-wire capacitance, the
20 reduction of the dielectric constant of an inter-layer dielectric formed between the metal wires has been considered. As an inter-layer dielectric having a low dielectric constant, a porous film has been under study as a replacement for a conventional silicon oxide film. It can be said that the porous film is only the film
25 capable of providing a dielectric constant of 2.0 or lower.